Please replace the Abstract, beginning at page 23, line 2, with the following rewritten paragraph:

~~Efficient~~ A digital signal processor for computing various types of ~~computation of~~ complex ~~long~~ multiplication ~~results and an efficient calculation of a covariance matrix are~~ is described. ~~A parallel array VLIW~~The digital signal processor operates in conjunction with registers, a multiplier, an adder, and a multiplexer ~~is employed, along with specialized complex long multiplication instructions and communication operations between the processing elements which are overlapped with computation to provide very high performance operation. Successive iterations of a loop of tightly packed VLIWs may be used allowing the complex multiplication pipeline hardware to be efficiently used.~~ The Registers store first and second complex operands. The multiplier simultaneously performs multiplications to produce each combination of products between the real and imaginary terms of the first and second complex operands. The multiplexer selects which produced products are added to or subtracted from each other based on the type of complex multiplication being performed. The adder simultaneously performs additions and subtractions, if necessary, to produce both real and imaginary results depending on whether the type of complex multiplication being performed is a conjugated operation. The registers store the results of the complex multiplication.